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REVIEWS AND ABSTRACTS OF LITERATURE

Die von M. von Rohr gegebene Theorie des Veranten, eines Apparats zur richtigen Betrachtung von Photographien. E. Wandersleb. *Verhandlungen d. D. Physikalischen Gesellschaft,* 1904, VI. Jahrg., Nr. 1, S. 44–60.

The Verant, a New Instrument for Viewing Photographs from the Correct Standpoint. Dr. M. von Rohr. *The Photographic Journal,* Nov., 1903, Vol. XLIII., pp. 279–290.

Der Verant, ein Apparat zum Betrachten von Photogrammen in richtigen Abstande. Dr. A. Köhler. *Photographische Korrespondenz,* 1904, S. 9–20.

A good photograph is an exact n-fold reduction of an object as seen from the position of the photographic lense. It follows then that in front of the lense there is a position in which the photograph could be put so that each point of the photograph would exactly intercept the direct ray of light from the corresponding point of the object. And if the human eye is now put in the place of the photographic lense, it is clear that the rays from the photograph will meet the eye at exactly the same angles as would rays from the real object: while if the eye were either nearer to or farther from the photograph these angles would no longer be the same. There is, then, one correct distance and position from which the eye should view any photograph (and a photograph should be looked at with but one eye). But with our ordinary photographs this distance is from 10–16 cm., whereas only a very short-sighted eye can focus for an object so near. The normal eye has to view the photograph from a greater distance (about 26 cm. at least) than the correct one, and this introduces a perspective distortion which tends to exaggerate the depth of the picture or else, if the observer knows the actual depth, tends to make the background look too small and the foreground too large (but one eye still being used).

Now this distortion could be obviated by enlarging the photograph, as was proposed by G. S. Cundell in 1844. But enlarging is altogether too expensive and troublesome a process. Therefore, at the instance of Professor A. Gullstrand the firm of Carl Zeiss (Jena) has prepared the Verant lense (*verus,* true) for the monocular inspection of ordinary photographs, such that if picture, lense and eye are properly placed, the eye sees an enlarged virtual image of the photograph, whose rays meet the eye at the same angles as they would if proceeding from the actual object. The effect is said to be highly natural. In the case of distant objects this is, if accommodation is a factor in space sensation, helped out by the fact that the accommodation is now for infinity.

This principle has been successfully applied to the stereoscope and to the telestereoscope: and a binocular Verant is soon to be put on the market. In this instrument stereoscopic pictures are used and the miniature effect which is sometimes troublesome in the ordinary stereoscope, is obviated. Identical pictures may be put into it if they show no foreground (that is, no objects nearer than the limits of purely binocular relief-perception), since otherwise the very principle of stereoscopy shows the picture flat. Corresponding to this refinement in viewing the stereoscopic pictures, these must now be taken with lenses whose distance apart is fairly close to the distance between the observer's eyes.

This instrument, which marks a great advance in the technique of reproductive art, is psychologically as well as physically interesting. A picture seen through the monocular Verant appears not only of natural size but also of natural depth. There is here no binocular stereoscopy, and Dr. von Rohr, who invented these lenses, ascribes this effect of depth to Helmholtz's representative factors (Vorstellungsmomente). This phenomenon shows how barbarous is the ordinary practice of viewing paintings and photographs with two eyes. The Verant will afford means of studying the perception of near objects with distant accommodation, whereas in previous stereoscopes the conditions have been the reverse. It remains, finally, to find out whether the fact that for distant objects in this stereoscope the two eyes are directed parallel, does not contribute as much to the viridical effect as does the enlargement of the picture, on which the inventor chiefly relies. For the apparent size of an object (as well as its apparent distance) depends on the convergence of the eyes, and in previous stereoscopes it has never been possible to adjust the pictures for parallel convergence, because of the therewith coordinated relaxation of the focus. It may be feared, however, that this last admirable feature may actually prevent the popular use of the Verant stereoscope, for it has been found that the untrained observer who looks into an ordinary stereoscope insists on converging sharply as if it were a newspaper, and generally needs some little practice before he is able to relax his convergence to even the slight degree required. This fact has for some time prevented the American firm of Underwood and Underwood from introducing stereoscopes with strongly magnifying prisms and more nearly parallel convergence.

The above three papers have nearly the same content; but that of Wandersleb has the fullest and clearest exposition.

EDWIN B. HOLT.

HARVARD UNIVERSITY.

L'evolution comme principe philosophique du devenir. W. M. KOZLOWSKI. *Revue Philosophique,* February, 1904, pp. 113–135.

The conception of evolution as a scientific theory is apparently of no value when applied to the universal syntheses with which philosophy deals. In the infinite reach of thought, the orderly changes which science perceives become fortuitous concourses of atoms. The author aims here to determine the philosophical significance of evolution in terms of a method which is based on the contradictions between the intuitional and discursive aspects of the theory.

For the first contradiction it may be said, on the one hand, that all observation of natural processes reveals an asymptotic principle of change. In general, neither an experience of the self nor a given state of the uni-